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ABSTRACT

An overview is presented on one series within a set of higher education indicators being developed at the National Center for Higher Education Management Systems (NCHEMS): a series dealing with the prices of tuition, room, and board. A Laspeyres-type index and a moving average are used to track tuition, room, and board prices for a sample of 2,488 institutions over the period from 1972-73 to 1979-80. The primary source of data was the annual Higher Education General Information Survey, the Institutional Characteristics Survey. Findings are disaggregated by type of institution (NCHEMS classification), public versus private control, and region of the country. Persistence, though not uniform, increases in average prices were found for all types of colleges and universities. Tuition increases typically did not keep pace with inflation over the period as a whole, but did so during the last few years of the period. The tuition gap between public and private institutions became larger. On a percentage basis, tuition increases at public two-year colleges were relatively high, but those institutions still enjoyed a substantial price advantage at the end of the period. Average tuition at North Atlantic public institutions increased more rapidly than that of public institutions elsewhere in the country. Increases in room and board prices lagged significantly behind increases in the price of rent and food at home. As a group, public two-year institutions also experienced a substantial enrollment growth during the period. Data are presented on tuition prices at doctorate-granting institutions, other four-year institutions, and by region, and other student expenses by living arrangement. (Author/SW)

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Abstract

NCHEMS is developing a series of higher education indicators. This paper presents an overview of one such series having to do with the cost of attending college. A Laspeyres-type index and a moving average are used to track tuition, room, and board prices for a sample of 2,488 institutions over the period from 1972-73 to 1979-80. Findings are disaggregated by type of institution (NCHEMS classification), public vs. private control, and region of the country. Persistent, though not uniform, increases in average prices were found for all types of colleges and universities. Tuition increases typically did not keep pace with inflation over the period as a whole, but did so during the last few years of the period. The tuition gap between public and private institutions became larger. On a percentage basis, tuition increases at public two-year colleges were relatively high, but these institutions still enjoyed a substantial price advantage at the end of the period. Average tuition at North Atlantic public institutions increased more rapidly than that of public institutions elsewhere in the country. Increases in room and board prices lagged significantly behind increases in the price of rent and food at home.

Indicators of Tuition, Room, and Board Prices: An Overview

This paper provides an overview of one series within a set of higher education indicators being developed at the National Center for Higher Education Management Systems (NCHEMS). This particular indicator series deals with a portion of the costs of attending college. The analysis deals primarily with the prices of tuition, room, and board. The important exclusion from the analysis is the opportunity cost of attending college, as measured by foregone earnings.

The indicators developed in this series measure changes in prices over time. Essentially, the task undertaken was to describe these changes in appropriate ways. Within the study, these changes are related in a very general way to changes in trends in participation rates, income, and other prices. However, the underlying reasons for changes in the prices of tuition, room, and board are not explored, nor is there any attempt to determine the impact of these prices upon the student or the institution. What is contained in this indicator series is thus only a portion of a larger agenda relating to student costs in higher education.

A key feature of the series is the analysis of various options for measuring changes in the prices of tuition, room, and board. Two procedures are eventually selected, and then used to create average tuition and room and board levels for all public and all private institutions in the analysis, as well as for various subsets, or classes, of institutions. A regional dimension is also included.

A full account of the methodology and findings related to this indicator series can be found in a research monograph entitled Higher Education

Indicators: Tuition, Room, and Board (forthcoming). The principal author is Maryann Brown, with assistance from Stuart Kahl and Kaye Kriz.

Methodology

The methodology section of the research monograph is rather lengthy. Only those elements that are more or less indispensible for interpreting the findings will be discussed here.

To begin with, there are four basic concepts of price movement to consider: product, product price, quality of product purchased, and time over which prices are evaluated. In this series, the product, whether it be educational services or food in the cafeteria, is assumed to remain unchanged from year to year, and the product price is the list, or advertised, price, as opposed to either the negotiated or the net price. The quantity purchased is one academic year of undergraduate higher education and housing and a certain number of meals during the academic year. It is assumed that the quality of higher education remained unchanged during the period in which price movements were examined. The time frame is the period from 1972-73 through 1979-80, divided into intervals of one academic year.

Two procedures were adopted for measuring change in prices over time: (1) a Laspeyres-type price index and (2) a moving average. The best known example of a Laspeyres-type index is the Consumer Price Index. The distinguishing feature of this type of index is that the set of goods purchased during a base year is held constant over the time frame under consideration. This feature allows pure price changes to be measured, but it can also be a weakness, as critics of the CPI have occasionally noted. In terms of the present study, the issue in question is whether changes in enrollment patterns have had much effect on price measures.

Price measurements using 1972 enrollment weights were compared with those using 1979 enrollment weights (or what is equivalent to a Paasche-type index, in as much as 1979 is the latest interval in the time frame). Overall differences were minute, but differences within several institutional sectors were sufficiently large to be of concern. Accordingly, a moving average, which explicitly recognizes changing enrollment patterns, was also used. Measurements based on both types of averages--a moving and a base-year--will be displayed in the tables that follow. The value of using both averages is that we account for both price and enrollment changes that affect the average price paid by the student. The difference in the two averages represents the effect of enrollment growth in differently priced institutions. The formulas used to calculate the base-year and moving averages are shown in Figure 1.

LASPEYRES:

$$P_i^L = \frac{\sum_{j=1}^{n} e_{j(1972)}\, p_{ij}}{\sum_{j=1}^{n} e_{j(1972)}\, p_{j(1972)}}$$

where:
i = 1972, 1973, . . ., 1979;
j = institution;
$e_{j(1972)}$ = enrollment in institution j during 1972;
p_{ij} = the price or cost paid by the student at institution j during year i;
n = number of institutions in the calculation.

MOVING AVERAGE:

$$A_i^{wa} = \frac{\sum_{j=1}^{n} (e_{ij}\, p_{ij})}{\sum_{j=1}^{n} e_{ij}}$$

where:
i = 1972, 1973, . . ., 1979;
j = institution;
p_{ij} = price or cost component under examination at institution j during year i;
e_{ij} = enrollment at institution j during year i;
n = number of institutions in the calculation.

Figure 1

There are several other methodological issues that bear mentioning. Tuition in this series includes required fees, and takes into account

differences for in- and out-of-state charges but not for differences based on other distinctions such as program of study and in- versus out-of-district charges. The ratio of in-state to out-state enrollments was based on 1979 data and that same ratio was applied throughout the time frame.

The universe for this series is comprised of institutions that are included in the HEGIS Institutional Characteristics Survey. This universe is fluid. From 1972 to 1979, 304 undergraduate institutions were added to the HEGIS survey while 110 institutions were deleted. Both the additions and the deletions were excluded from the analysis. Also excluded were 303 institutions for which complete data was not available. Other minor modifications to the universe were also required. After all adjustments, 2488 institutions remained as the basis for tuition calculations. These institutions accounted for more than 99 percent of full-time undergraduate enrollment in 1978-79. Table 1 shows these institutions disaggregated by NCHEMS class, as well as the number of institutions used in calculating room and board prices.

The primary source of data was the annual HEGIS Institutional Characteristics Survey, which, in addition to listing accredited institutions offering at least a two-year degree, also provides data on tuition, room and board rates. Substantial efforts were made to correct faulty data, but it is reasonable to assume that some data errors remain.

Findings

The indicators developed here track a persistent, though not uniform, increase in prices at all types of colleges and universities across the years from 1972-73 to 1979-80. The tuition gap between public and private institutions was large at the beginning of the period, and it became wider over

Table 1

Number of Institutions
(1) Used in Calculations for Tuition
(2) Used in Calculations for On-Campus Room and Board

	Control					
	Public		Private		Total	
Level	N1*	N2*	N1*	N2*	N1*	N2*
Major Doctoral	51	50	25	24	76	74
Other Doctoral	58	54	35	32	93	86
Comprehensive	237	188	142	135	379	323
Baccalaureate	107	83	603	572	710	655
Two-Year	758	152	174	136	932	288
Specialized	54	30	244	160	298	190
Total	1265	557	1223	1059	2488	1616

N1 = Number of institutions used in tuition calculations

N2 = Number of institutions used in on-campus room and board calculations

the period. As shown in Table 2, the average price paid by students in 1972-73 was $539 at public institutions and $1,953 at private institutions. Over the next seven years, the average private college tuition increased 65 percent to $3,213, while public college tuition increased 47 percent to $794. In other words, students attending private institutions paid tuition prices in the fall of 1979 that averaged $1260 above prices in 1972, or four times the price paid by their counterparts at public institutions.

While the rate of tuition increase among private institutions was greater than among public institutions, it was not out of step with price movements in other areas of the economy. In recent years, as shown in Figure 2, the rate of tuition-price increase in private institutions has been generally consistent with the movement of the Consumer Price Index. Moreover, it has been notably similar to the trend in higher-education purchasing or resource costs (as measured by the Higher Education Price Index). Although tuition increases at public institutions lagged noticeable behind price increases in the general economy for the overall time period, from 1975 onward these rates paralleled increases in higher-education purchasing costs. In other words, by the latter half of the decade increases in tuition price in both the private and public sectors appear to have been driven by institutional costs, and were keeping pace with general inflation.

There were wide variations in pricing among the colleges and universities examined, however. Public tuition ranged from zero to $1,565 in 1972-73 and from zero to $2,216 in 1979-80. Similarly, private tuition ranged from zero to $3,975 in 1972-73 and from zero to $6,590 in 1979-80. Even among the major research universities, perhaps the most homogeneous grouping examined here, the range was wide. Tuition prices among the 51 public major research universities ranged from $233 to $1,200 in 1972-73 and from $438 to $2,216 in

Table 2

Average Tuition Per Student

Public and Private Institutions
(1979 Enrollment-Weighted Average in Parentheses)

Control	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Public	$539 (522)	$534 (540)	$547 (557)	$574 (592)	$642 (654)	$688 (698)	$733 (735)	$794
Private	$1,953 (1,905)	$2,022 (2,008)	$2,152 (2,140)	$2,327 (2,336)	$2,514 (2,519)	$2,699 (2,705)	$2,945 (2,941)	$3,213

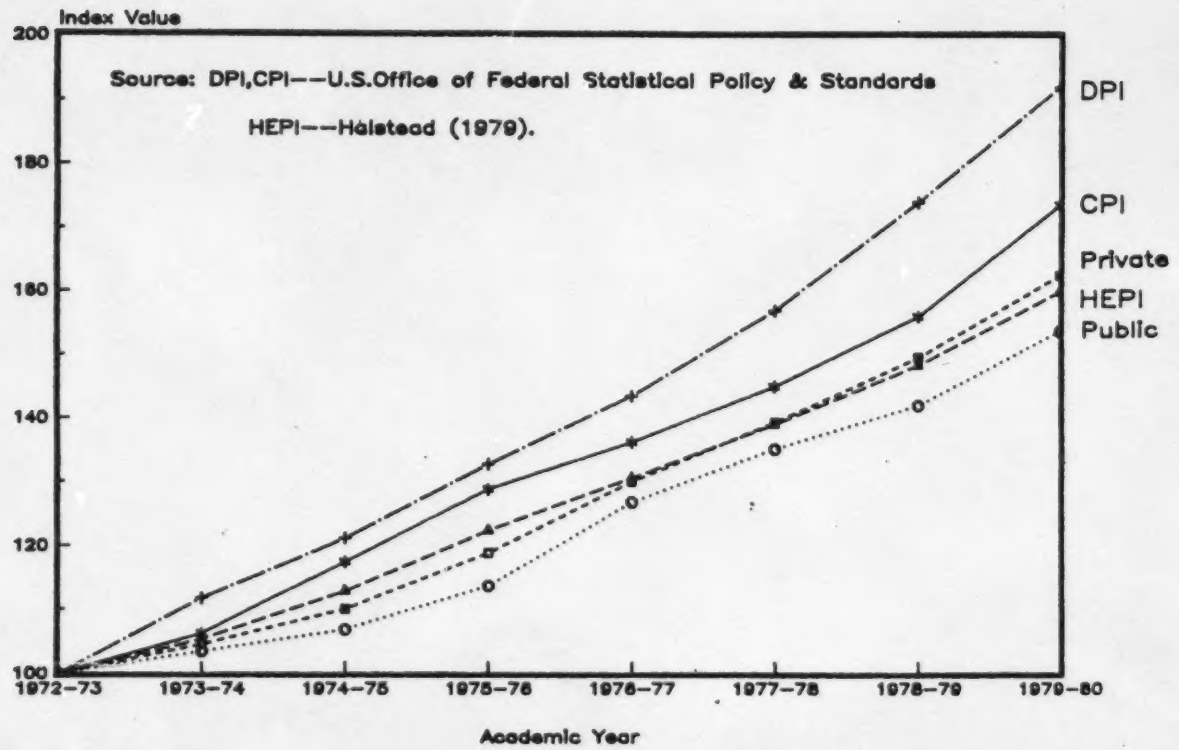

Figure 2. A comparison of tuition price movements for public & private institutions with Consumer Price Index, Disposable Personal Income, & Higher Education Price Index

1979-80. The range of these prices among the 25 private major research universities was from $2,245 to $3,099 in 1972-73, and from $3,301 to $5,745 in 1979-80. Furthermore, the manner in which these prices rose differed greatly among institutions. For example, while the average tuition price for two-year institutions was lower than that for four-year institutions, the rates of price increase among both public and private two-year institutions did not lag behind those of their four-year counterparts. In fact, public comprehensive two-year institutions--the largest subgroup of two-year public institutions--increased tuition prices at rates that exceeded all but those of public professional and specialized schools. Similarly, private two-year vocational and technical schools--the largest private two-year subgroup--maintained price-increase rates that were greater than those of all but private major research universities. This finding corresponds well with the fact that lower-priced institutions generally increased tuition prices at rates substantially above the rates of increase for higher-priced institutions. The 451 public institutions charging $200 or less for in-state tuition during the 1972-73 academic year had increased prices by 139 percent by 1979-80, in contrast to the average increase of 52 percent for in-state tuition at public institutions generally; for the 669 private institutions charging $1,000 or less in tuition for the academic year 1972-73, prices rose by 90 percent, in contrast to the average private-tuition increase of 65 percent from 1972-73 to 1979-80. Figures 3 through 6 display changes in tuition over the time frame for the eight institutional categories included in the analysis.

Regional pricing differences are also apparent. As shown in Table 3, average tuition at North Atlantic public institutions increased more rapidly than that of public institutions elsewhere in the country. Furthermore, the dollar amount of these increases was larger, with average tuition increasing

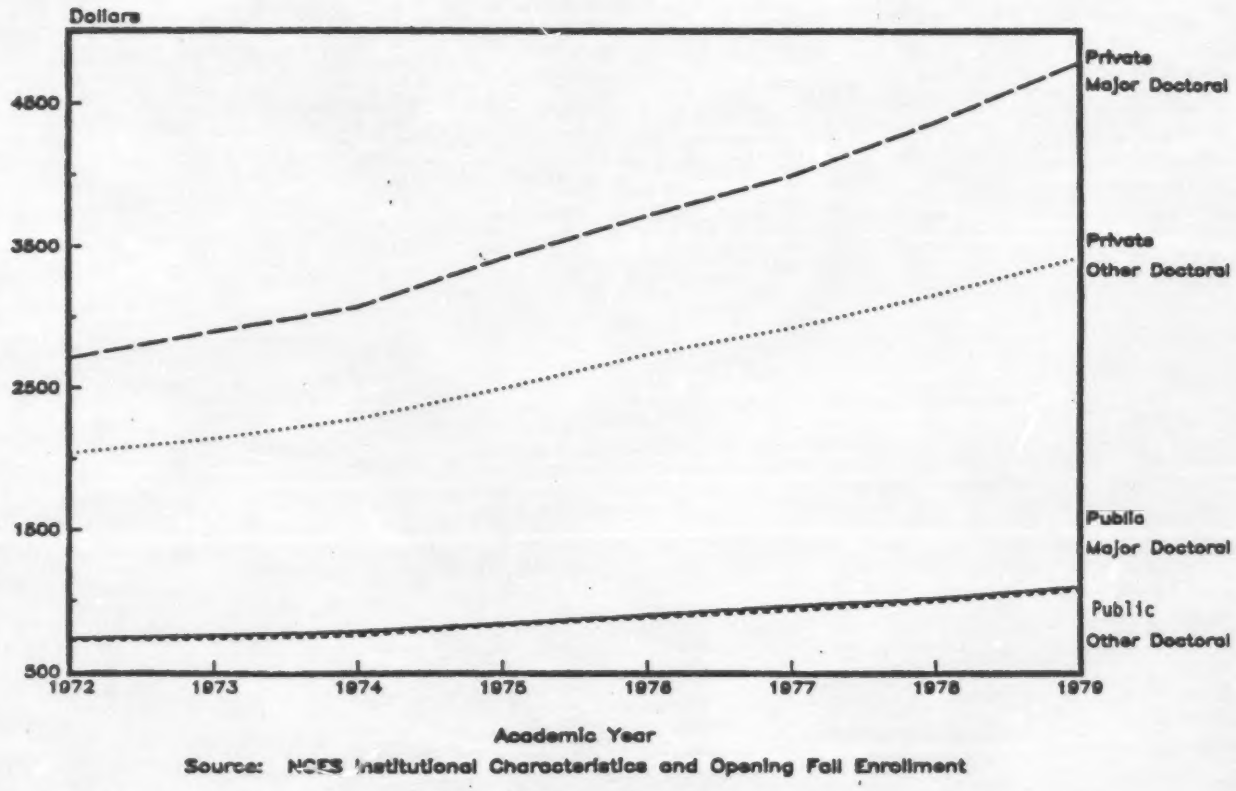

Figure 3. Tuition prices at doctorate-granting institutions, 1972-1979

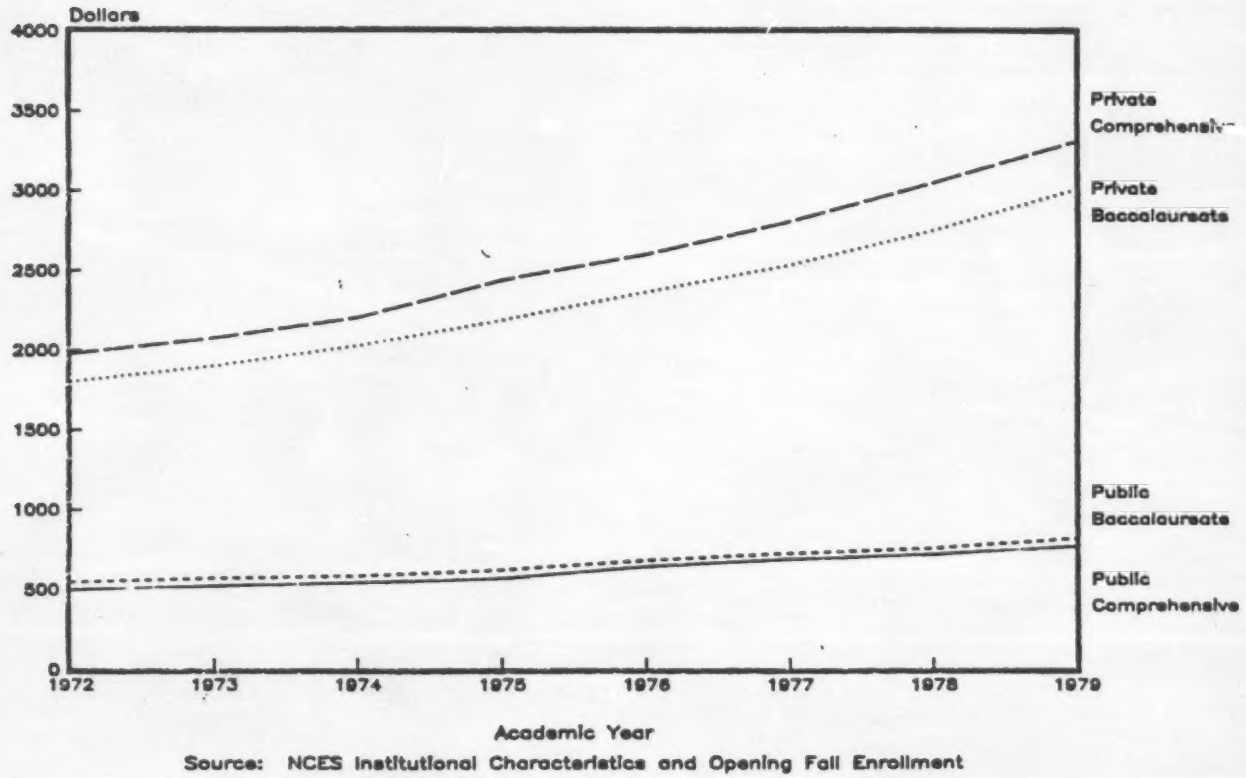

Figure 4. Tuition prices at other four-year institutions, 1972-1979

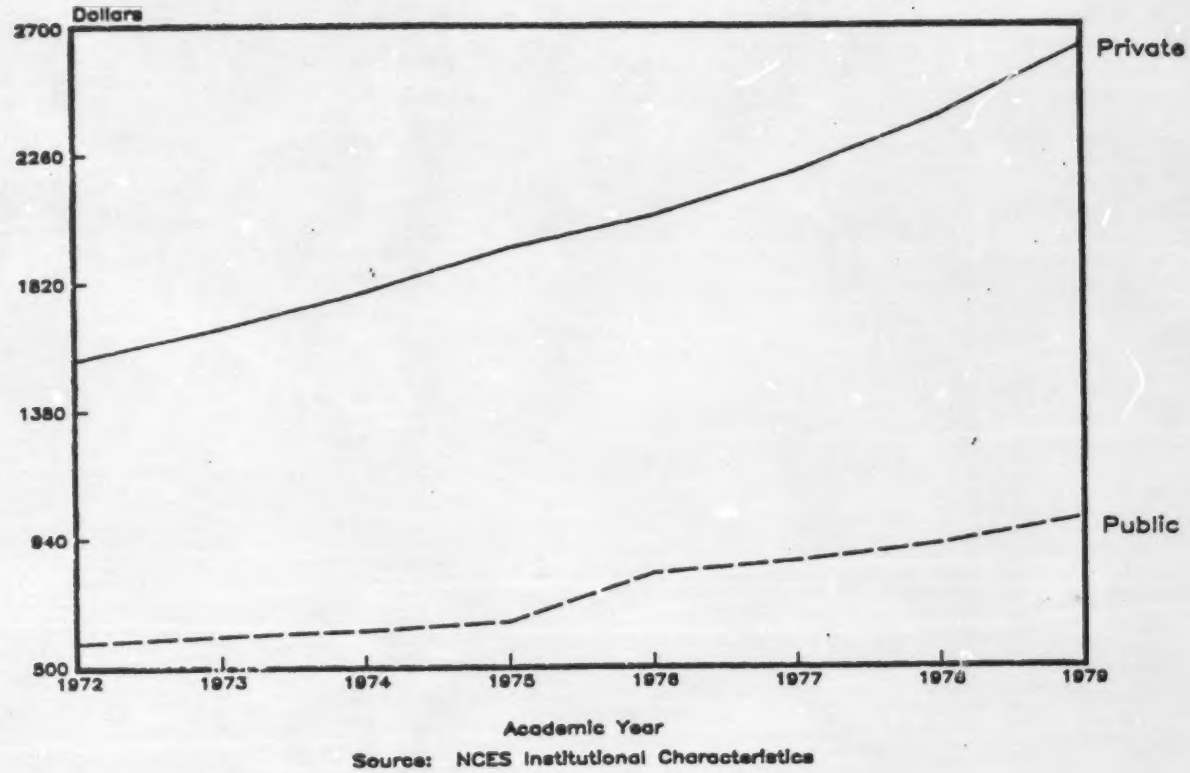

Figure 5. Tuition prices at specialized and professional institutions, 1972-1979

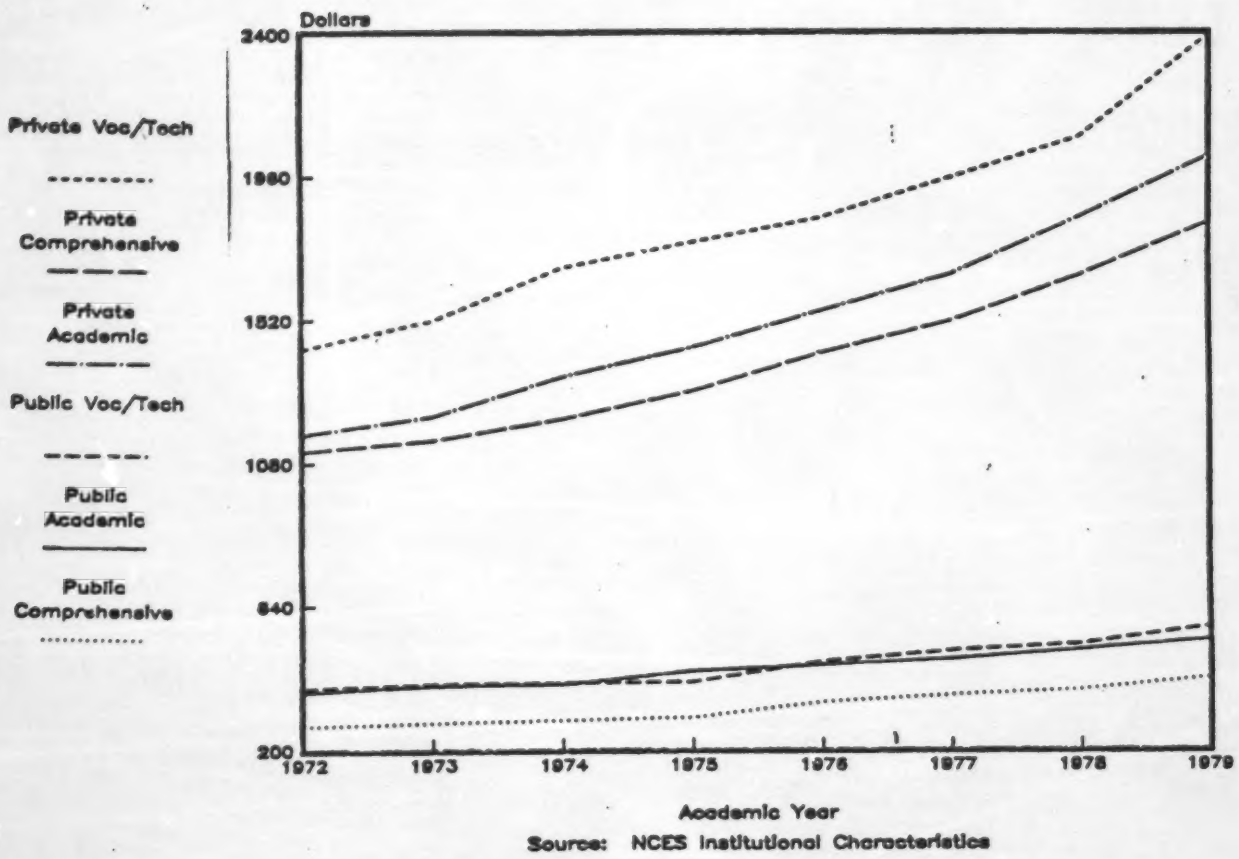

Figure 6. Tuition prices at two-year institutions, 1972-1979

Table 3

Average Tuition by Region
Public and Private Institutions
(1979 Enrollment-Weighted Average in Parentheses)

PUBLIC	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
North Atlantic	$599 (603)	$625 (635)	$631 (645)	$668 (682)	$846 (851)	$899 (900)	$948 (948)	$1,042
Great Lakes/ Plains	$650 (629)	$648 (648)	$670 (669)	$693 (702)	$743 (748)	$807 (812)	$859 (861)	$939
Southeastern	$519 (500)	$521 (519)	$534 (535)	$569 (584)	$608 (615)	$641 (646)	$665 (666)	$707
Southwest/ West	$411 (393)	$380 (397)	$402 (419)	$418 (443)	$449 (470)	$485 (502)	$528 (532)	$565
PRIVATE								
North Atlantic	$2,272 (2,205)	$2,346 (2,326)	$2,484 (2,458)	$2,694 (2,700)	$2,910 (2,905)	$3,123 (3,117)	$3,386 (3,378)	$3,683
Great Lakes/ Plains	$1,908 (1,851)	$1,962 (1,936)	$2,101 (2,080)	$2,244 (2,246)	$2,411 (2,413)	$2,59[illegible] (2,602)	$2,833 (2,831)	$3,100
Southeast	$1,557 (1,500)	$1,600 (1,588)	$1,698 (1,697)	$1,828 (1,847)	$1,970 (1,999)	$2,106 (2,125)	$2,320 (2,324)	$2,540
Southwest/ West	$1,607 (1,625)	$1,731 (1,727)	$1,858 (1,862)	$2,034 (2,030)	$2,230 (2,217)	$2,391 (2,394)	$2,622 (2,616)	$2,863

North Atlantic States: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont

Great Lakes/Plains States: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin

Southeastern States: Alabama. Arizona, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia

Western/Southwestern States: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, Wyoming

from $599 in 1972-73 to $1,042 in 1979-80. Among private institutions, regional differences in pricing were less pronounced; the West/Southwest region increased the most--78 percent from 1972-73 to 1979-80.

The price of room and board contributed slightly to the gap in prices between public and private institutions. As shown in Table 4, in 1972-73 these charges were slightly higher in private institutions than in public institutions--$1,124 versus $1,018. Thereafter, these charges increased at a slightly faster rate in private institutions: 57 percent versus 51 percent over the period. In both sectors, however, these increases lagged significantly behind increases in the prices of rent and food at home, which rose by 78 percent from 1972 to 1979. Moreover, while students in the private sector paid tuition prices four times as high as at public institutions, students at private institutions were charged combined prices for tuition, room, and board only twice as high as those charged students at public institutions (see Table 5).

Finally, a brief note about other expenses--books and supplies, personal expenses, transportation--rounds out the picture. Comparing findings of the College Scholarship Service regarding student expenditures for 1976 (Suchar, Van Dusen, and Jacobson 1976) and 1979 (Case and Jacobson 1979), Figure 7 shows that expenses other than tuition, room, and board rose less than 15 percent for students living on campus. With the exception of private, four-year enrollments, students living off campus faced more rapidly increasing prices than their on-campus peers--due primarily, of course, to differences in transportation costs. Overall, the increase in these additional expenses was considerably less than the 39 percent increase in the CPI for the 1976 to 1979 period. A caveat about these data on additional expenses. Leslie's findings

Table 4

Average Room and Board Charges by Institutional Control and an Index of Food at Home and Rent (1974 Occupancy-Weighted Index in Parentheses)

	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
PUBLIC	$1,018	$1,047 (102.7)	$1,123 (109.9)	$1,200 (117.8)	$1,274 (125.1)	$1,339 (131.6)	$1,416 (139.2)	$1,541 (151.4)
PRIVATE	$1,124	$1,165 (103.6)	$1,248 (111.0)	$1,343 (119.4)	$1,438 (127.6)	$1,531 (135.6)	$1,636 (145.1)	$1,771 (156.9)
CPI Index of Rent and Food at Home (Rescaled)	100	112.7	126.4	135.8	140.6	148.1	162.4	177.8

Table 5

Average Tuition, Room, and Board for Public and Private Institutions
(1979 Occupancy-Weighted Average in Parentheses)

	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Public	$1,661 (1,663)	$1,711 (1,711)	$1,812 (1,807)	$1,927 (1,928)	$2,058 (2,058)	$2,175 (2,177)	$2,247 (2,301)	$2,492
Private	$3,144 (3,138)	$3,296 (3,285)	$3,519 (3,509)	$3,806 (3,809)	$4,106 (4,106)	$4,395 (4,396)	$4,762 (4,758)	$5,180

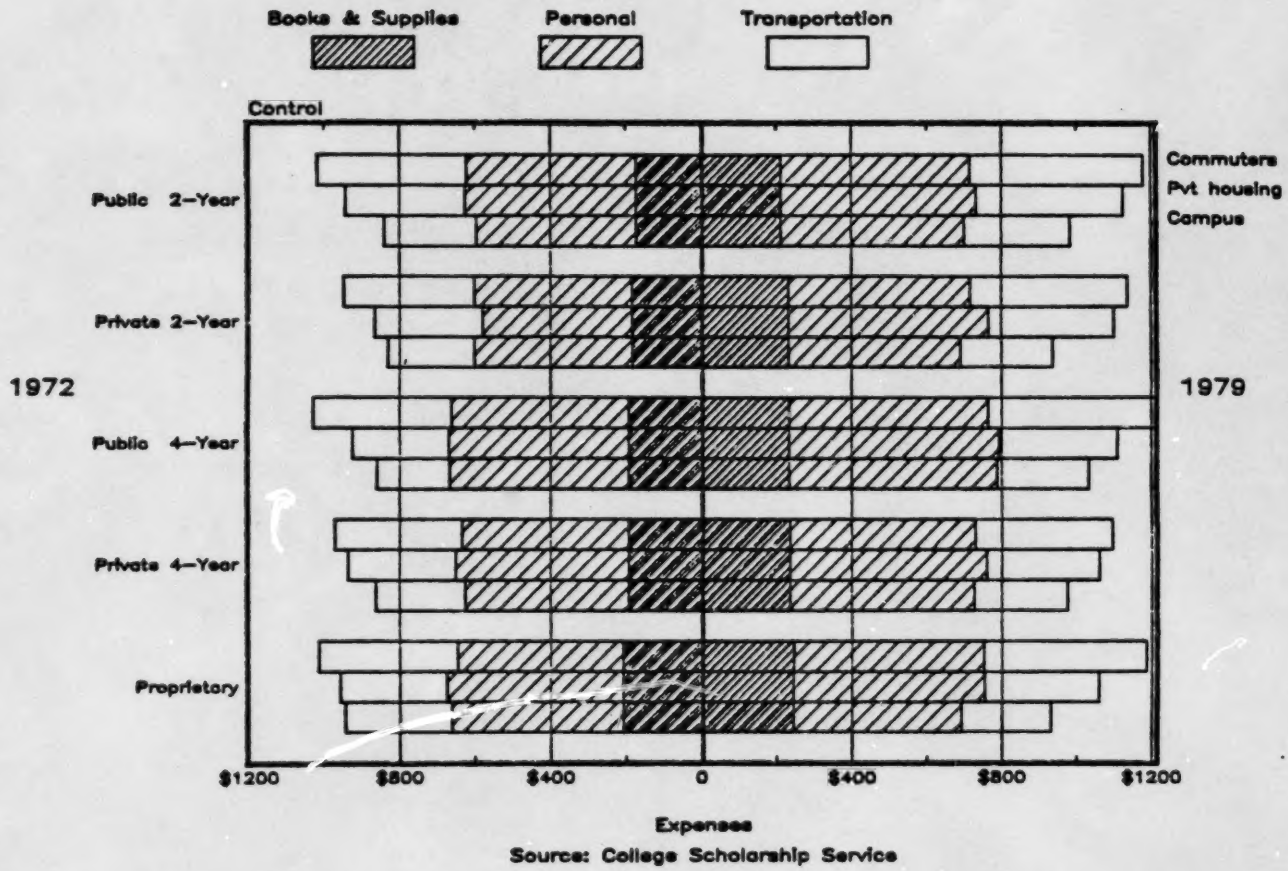

Figure 7. Other student expenses by living arrangement, 1976 and 1979

(forthcoming) using data from the National Longitudinal Study of the High School Class of 1972 suggests that the average reported income of students is typically insufficient to cover the institutionally estimated student budgets that are reported to the College Board. It may be that the market basket of goods actually purchased by students is different than the one whose price behavior is tracked in the College Board data.

Conclusion

Tuition, room, and board prices rose across the spectrum of higher education institutions during the period from 1972-73 through 1979-80. These increases were less, however, than those measured by the Consumer Price Index for the same period. They were also less than the increase in disposable personal income. College, then, was more affordable at the end of the period than at the beginning, at least from the perspective of relative list prices and personal income; and this is true apart from any consideration of the growth over the period in those student aid programs which effectively reduce the price of attendance.

The much publicized gap between public and private tuition rates increased during the period. Presumably, the rapid rise in federal and other student aid monies during the 1970s blunted the impact of this price differential. The differential is likely to have a greater effect on relative demand during the early to mid-1980s as federal student aid is reduced. At the same time, weak financial conditions in many states point to heavy upward pressure on tuition rates at many public institutions. Conceivably, and in contrast to the 1970s, tuition increases at these institutions might even outpace the general inflation rate for a time. In conjunction with a decline in federal student

aid, such a development might give new impetus and direction to student activism.

Within the public sector, it is notable that the greatest percentage increases, apart from professional and specialized schools, occurred at the comprehensive two-year institutions. As a group, the latter institutions also experienced a substantial enrollment growth during the period. Despite the relatively rapid increase in prices, they still had a substantial tuition rate advantage at the end of the period when compared to other higher education institutions, public as well as private. On that basis, a continuation of a strong enrollment performance on the part of public community colleges can be expected. However, in view of the rather gloomy demographic picture in many parts of the nation, that may mean stabilization rather than growth.

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